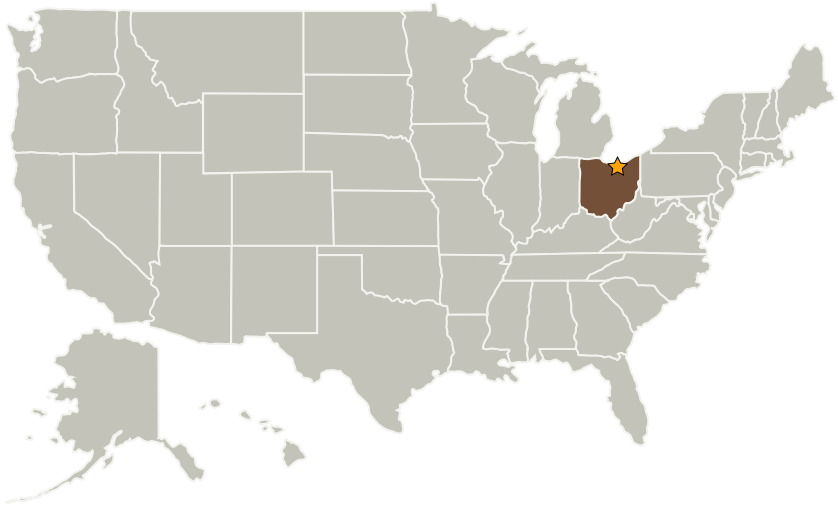
High-Power Density SOFCs for Aviation Applications, Phase I

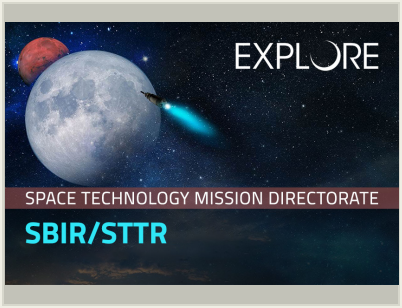
Completed Technology Project (2004 - 2004)

Project Introduction

As solid oxide fuel cells (SOFCs) approach commercialization, interest in broader applications of this technology is mounting. While the first commercialized systems are being designed to provide 3-5 kW in stationary and automotive auxiliary power unit (APU) applications, aerospace and military users are considering integrating SOFCs into larger, airborne systems with considerable commercial payback. SOFCs are aligned to displace inefficient, noisy, and polluting technologies such as diesel generators that will provide both economic and environmental motivation to prospective users. NexTech Materials will develop a solid oxide fuel cells that demonstrate high power density, targeting 2W/cm2, a level of performance that will enable the compact, lightweight systems required for aerospace applications to become a reality. Such high power density SOFCs will provide the bridge from stationary residential power systems to airborne auxiliary power units. The fuel cells that result from these applications will lead the way to efficient and clean aircraft. This Phase I work will focus on processing and evaluating highly conductive electrolyte and electrode materials and the incorporation of these materials into high power density, SOFC cells suitable for commercial stack fabrication in Phase II.

Primary U.S. Work Locations and Key Partners





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Organizational Responsibility

Responsible Mission Directorate:

Space Technology Mission Directorate (STMD)

Lead Center / Facility:

Glenn Research Center (GRC)

Responsible Program:

Small Business Innovation Research/Small Business Tech Transfer

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Organizations Performing Work	Role	Type	Location
★Glenn Research Center(GRC)	Lead Organization	NASA Center	Cleveland, Ohio
NexTech Materials, Ltd.	Supporting Organization	Industry	Lewis Center, Ohio

Primary U.S. Work Locations
Ohio

Project Management

Program Director:

Jason L Kessler

Program Manager:

Carlos Torrez

Principal Investigator:

Edward M Sabolsky

Technology Areas

Primary:

- TX03 Aerospace Power and Energy Storage
  - TX03.2 Energy Storage
    - TX03.2.2 Electrochemical: Fuel Cells